



pork industry handbook

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Edema Disease (Gut Edema; *E. Coli* Enterotoxemia)

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Edema disease usually occurs 3 days to 2 weeks after weaning, but it is seen occasionally in nursing pigs. Affected pigs develop nervous symptoms or die suddenly.

Edema is an excessive accumulation of fluid in body tissues. The disease was named "edema disease" or "gut edema" because those who first observed the disease in the 1930s found excess fluid in the walls of the stomach and intestine, or under the eyelids, of some pigs with this problem. Pigs with edema disease may have excess fluid in many parts of the body, but involvement of the brain is most important and causes the clinical symptoms.

Incidence

Edema disease can affect pigs 3-14 weeks old but usually occurs within 3 days to 2 weeks after weaning. The affected pigs often are the most thrifty and fast-growing individuals of a group. It commonly is seen under conditions of excellent management and nutrition. The morbidity rate usually is about 15%, but 50% or more of some groups are affected.

Symptoms

One or more pigs may be found dead unexpectedly. At the same time, one usually finds pigs with nervous symptoms, including staggering, head tilting, stumbling and falling, assuming a "dog sitting" position, lying on the sternum, or lying on the side and making continuous kicking movements (Figs. 1-3). Affected pigs do not have a fever unless the environmental temperature is unusually high. Some pigs may have swollen eyelids. The mortality rate among pigs with symptoms is about 65%. Those that do not die show improvement after 2 days.

The course of the disease is about 2 to 5 days, but in some herds, there is a recurrence 10 days to 2 weeks later. In this second outbreak, affected pigs often walk slowly or

wander aimlessly around the edge of the pen, with the head slightly elevated or tilted to one side (Fig. 4).

Cause

The symptoms result from rapid growth of certain types of bacteria, *Escherichia coli*, in the small intestine. After weaning, the number of *E. Coli* in the intestine tends to increase; this usually reaches a maximum about 4 days post-weaning. There are many different types of *E. coli*, most of which do not cause edema disease. But if there are edema disease-producing strains of *E. coli* in the intestine, these also will increase during the post-weaning period and may become the predominant bacteria in the small intestine.

Edema disease-producing strains of *E. coli* produce one or more toxins that are absorbed from the intestine into the blood. These toxins damage blood vessels and affect blood pressure, which in turn causes fluid to leak from vessels and accumulate in many body tissues. This fluid accumulation is most important in the brain, where swelling can result in destruction of some brain tissue and, in many cases, death of the animal.

Differential Diagnosis

There are many diseases of young pigs that produce symptoms similar to edema disease. Some of the more common problems include the following:

- Virus infections (pseudorabies, hemagglutinating encephalomyelitis virus, poliоencephalomyelitis)
- Water deprivation (salt poisoning)
- Bacterial infections (Glasser's disease, bacterial meningitis, ear infection)
- Porcine stress syndrome
- Mulberry heart disease
- Chemical poisons (arsenic, lead, mercury, various insecticides and rodenticides)

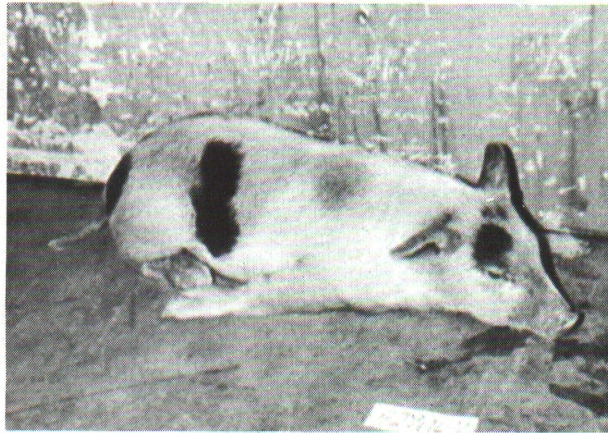


Figure 1. Pig with acute edema disease. The pig is lying on its sternum, unable to move.

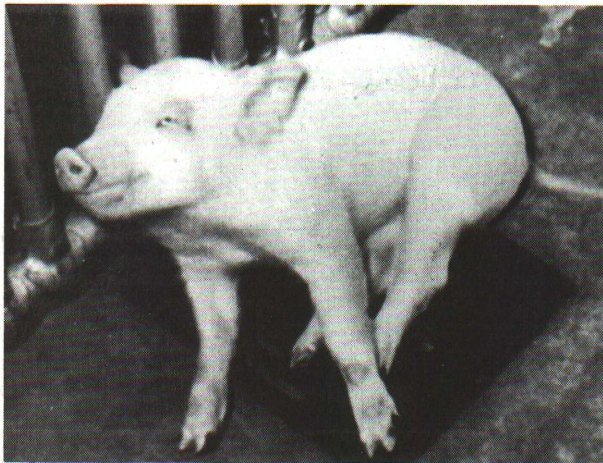


Figure 2. This pig with edema disease has swollen eyelids, and assumes a "dog-sitting" position.

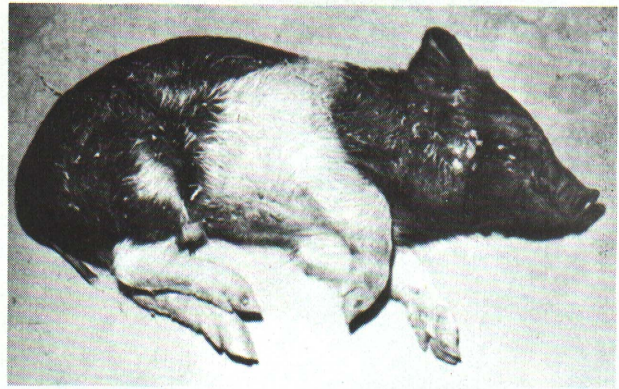


Figure 3. Edema disease. The pig has been down on its side for two days, making continuous paddling movements with its front legs.

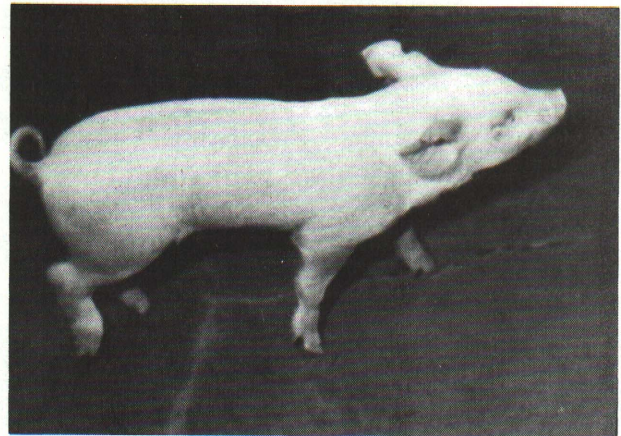


Figure 4. Pig with edema disease from a herd that had an outbreak of edema disease several days after weaning. This pig became sick 10 days later, after the initial outbreak had subsided. It is walking slowly in a circle, with the head elevated.

It is important to obtain an accurate diagnosis, since treatment and preventive measures are specific for each of these different diseases.

Treatment and Control

An abrupt change in the ration may help to prevent additional cases. Changing the diet will alter the growth conditions for bacteria in the intestine, and it may allow other types of bacteria to proliferate and replace the strains of *E. coli* that cause edema disease. (Even though a change in the diet may help to stop the outbreak, this does not imply that the original ration was improperly formulated. Changing the feed simply is an effort to alter the conditions for bacterial growth within the intestine.) Withholding feed temporarily, or feeding soaked whole oats for 1-2 days are methods that have been used to change the diet suddenly.

The original ration may be restored gradually over a period of 4-5 days.

Treatment with antibacterial drugs may also help prevent additional cases. Treatment of pigs that have clinical symptoms, however, often is ineffective.

In some herds, edema disease tends to occur in each successive group of pigs that is weaned. The use of antibiotics or sulfonamides in the feed or water at weaning time may be beneficial in these herds.

Vaccines produced from edema disease-producing strains of *E. coli* generally have been ineffective in preventing the problem.

Treatments or changes in management practices should be designed to meet the needs of each individual production unit. Consult your veterinarian to obtain recommendations for your herd.

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